

Qualas⁴

Class 4 Diode Laser System



User's Guide



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Using Qualas4

P1

Qualas4 can be used for treatment of diseases and conditions, follow the recommended dosage and treatment time to get the best efficacy. You can also find new information about using Qualas4 on the web www.konftec.com.

Qualas4 is provided as the most intelligent and convenient laser device for the veterinarians to apply the high power laser therapies:


Red Laser Therapy

- After Surgery
- Burns, Ulcers, Bite, Wound
- Gingivitis, Periodontal Diseases, Stomatitis
- Pododermatitis, Otitis, Infections

Infrared Laser Therapy

- Pain, Tear, Edema, Lesions
- Arthritic, Joint, Hip, Disc
- Nerve Regeneration, Neuropathies, Tendon, Ligament
- Acupuncture, Trigger Point

Specifications

Operation Environment	0 ~ 40 °C (32 ~ 104 °F); 10 ~ 95%RH (Non-condensing)	
Power Supply	90 ~ 250V AC, 47Hz ~ 63Hz; Max. 100VA	
Laser Material	Semiconductor Laser Diode	
Laser Classification	Class IV	
Wavelength ... Power	635nm... 1 Watt 808nm... 12 Watt 980nm... 12 Watt	
Pilot Beam	635nm... 50 mW	
Time Setting	1 ~ 60 Minutes	
Frequency Setting	0 Hz (Continuous Wave); 1 ~ 20,000 Hz (Modulation)	
Operation & Display	Color LCD Touch Screen	
Operation Override	Touch Sensor Equipped in Handheld Piece	
Operation Beep	Adjustable 0 ~ 20 second; 0 second (silence)	
Medical Device Certificate	GMP (Good Manufacturing Practice)	
Dimensions	29.5(L) x 25.5(W) x 20(H) cm; 11.6(L) x 10(W) x 7.9(H) in	
Weight	4.3 Kg (9.5 Lb)	

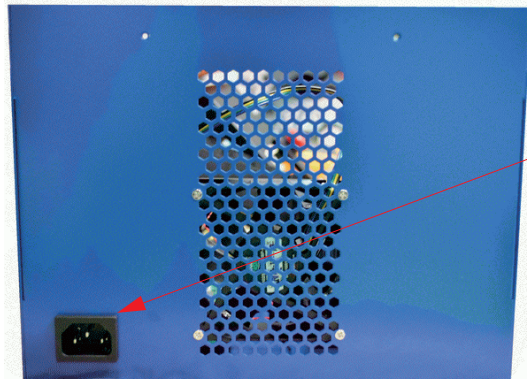
Front Panel



Emergency Stop Switch

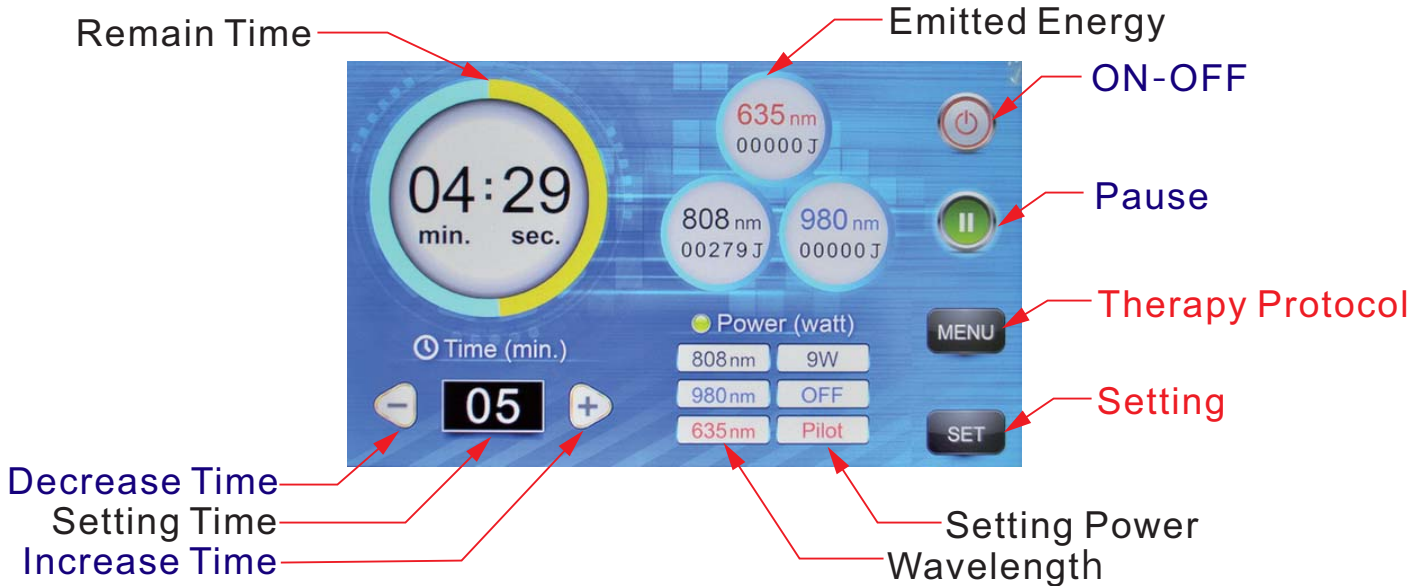
Key Switch

Rear Panel



Power Supply Socket

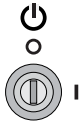






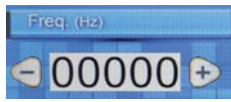


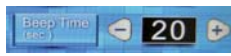
Main Panel



Setting Panel

The screenshot shows the 'Setting Panel' on an LCD display. The panel is blue and contains several settings:

- Frequency Setting:** A digital display showing '00000' Hz with minus and plus buttons. An annotation points to this display with the text 'Frequency Setting 0 Hz (Continuous)'.
- Fan Delay (sec.):** A digital display showing '20' with minus and plus buttons. An annotation points to this display with the text 'Fan Delay Time'.
- Alert Time Setting:** A digital display showing '0' with minus and plus buttons. An annotation points to this display with the text 'Alert Time Setting 0 Second (Mute)'.
- Beep Time (sec.):** A digital display showing '20' with minus and plus buttons.
- Power (watt):** A section with a yellow indicator light and three columns of power settings for different wavelengths:
 - 808nm:** Buttons for OFF, 6W, 0.5W, 9W, 3W, and 12W. An annotation points to this column with the text '808nm Power'.
 - 980nm:** Buttons for OFF, 6W, 0.5W, 9W, 3W, and 12W. An annotation points to this column with the text '980nm Power'.
 - 635nm:** Buttons for Pilot, 0.5W, and 1W. An annotation points to this column with the text '635nm Power'.
- BACK:** A button at the bottom right. An annotation points to it with the text 'Back to Main Menu'.

OPERATION			LCD Display	Remarks
Step	Action	Key-in		
1	Power ON			LCD Display The Last Setting Before Turn Off
2	Time Setting	 		Range : 1~60 Min.
3	Frequency Setting	 		Range: 1 ~ 20000Hz 0 Hz(Continuous)
4	Alert Time Setting	 		Range: 1 ~ 20 Sec. 0 Sec. (Mute)

Therapy Protocol Selection Block

After Surgery

**Burns, Ulcers
Bite, Wound**

**Gingivitis, Stomatitis
Periodontal Diseases**

**Pododermatitis
Otitis, Infections**

**Pain, Tear
Edema, Lesions**




**Arthritic, Joint
Hip, Disc**

**Nerve Regeneration
Neuropathies
Tendon, Ligament**

**Acupuncture
Trigger Point**




**Simplified
Therapy Protocol**

Therapy Protocol

After Surgery			Qualas4 (Red Laser 635nm)			
3+2+1 = Three treatments the first week, two the second, and one the third						
Indication	Frequency	Dose (J/cm ²)	Therapy Time (sec.)			Notes Laser Power: 0.5 ~ 1W List: 1W
			Ball (Focus)		Len (Disp.)	
			<1.8cm ²	<3.8cm ²	>3.1cm ²	
						
			Ø30mm	Ø50mm	Ø30mm	
Abscess Incision	1/day for 4~5 days	8	17	37	29	
Drainage and Flush Abscess	1/day for 5~6 days	8	17	37	29	with Cellulitis, Incision, Drainage, and Flush
Amputation	Immediate, Post Surg 1x	8	17	37	29	Acute pain 2-3 days
Aural Hematoma(Post Surgery)	1/day	6	13	27	22	Acute inflammation 1x Immobilize ear, treat cause
Cystotomy	During surgery	8	17	37	29	Maintenance as needed
Degloving Wounds	1/day for 3~5 days	8	17	37	29	then 2~3/week until healed
Dewclaw Removal	Immediately post-op	8	17	37	29	
Dorsolateral Hemilaminectomy	Immediately post-op	8	17	37	29	then 2~3x more
Enterotomy	During surgery 2~3/week	8	17	37	29	or 3+2+1
Feline Declaw	Immediately post-op	6	13	27	22	Also next day if in hospital
Femoral Head Osteotomy	Immediately post-op	6	13	27	22	Also next day if in hospital
FLUTD(Feline Lower Urinary Tract)	1x to relieve blockage	6	13	27	22	3+2+1 for cystitis if needed
Fractures - After Surgery	2~3/week or 3+2+1	8	17	37	29	
Hernia Repair	2~3/week or 3+2+1	10	21	46	36	(Not a substitute for cleaning)
Orchiectomy Canine and Feline	Immediately post-op 1x	8	17	37	29	
Ovariohysterectomy Canine and Feline	Immediately post-op 1x	10	21	46	36	
Stifle Surgery - TPLO/TTA	3+2+1	8	17	37	29	



Therapy Protocol

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Burns, Ulcers, Bite, Wound			Qualas4 (Red Laser 635nm)			Notes Laser Power: 0.5 ~ 1W List: 1W
Indication	Frequency	Dose (J/cm ²)	Therapy Time (sec.)			
			Ball (Focus)		Len (Disp.)	
			<1.8cm ²	<3.8cm ²	>3.1cm ²	
						
			Ø30mm	Ø50mm	Ø30mm	
Burns	1/day for 3~5 days	8	17	37	29	then 2~3/week until healed
Decubital Ulcers	1/day for 3~5 days	6	13	27	22	then 2~3/week until healed
Wounds	3~5/day	10	21	46	36	Decrease treatments as healing progresses
Feline Acne	Post surgical 1x	6	13	27	22	Be careful of thyroid
Insect Bite/Snake Bite	1x, may need 3+2+1	6	13	27	22	1~3x, depending on bite severity
Feline Tail Pull injuries	2~3/week or 3+2+1	6	13	27	22	




Therapy Protocol

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Gingivitis, Periodontal Diseases, Stomatitis			Qualas4 (Red Laser 635nm)		
3+2+1 = Three treatments the first week, two the second, and one the third					
Indication	Frequency	Dose (J/cm ²)	Therapy Time (sec.)		Notes
			Fiber Rod  Ø8mm	Len  Ø30mm	
Gingivitis	2~3x, based on severity	6	3	22	Laser Power: 0.5 ~ 1W List: 1W
Periodontal Diseases	2~3/week or 3+2+1	6	3	22	Determine acute or chronic
Stomatitis	Daily (Depends how chronic)	6	3	22	also use 3+2+1 (6~12 treatments, then maintenance)




Therapy Protocol

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Pododermatitis, Otitis, Infections			Qualas4 (Red Laser 635nm)			
3+2+1 = Three treatments the first week, two the second, and one the third						
Indication	Indication	Dose (J/cm ²)	Therapy Time (sec.)			Notes Laser Power: 0.5 ~ 1W List: 1W
			Ball (Focus)		Len (Disp.)	
			<1.8cm ²	<3.8cm ²	>3.1cm ²	
						
			Ø30mm	Ø50mm	Ø30mm	
Allergic Pododermatitis	2~3/week or 3+2+1	6	13	27	22	
Lick Granulomas	1/day	6	13	27	22	2~3/week or 3+2+1
Vasculitis - Non-infectious	2~3/week or 3+2+1	10	21	46	36	Be careful of possible thrombosis
Otitis - Acute	2~3/week or 3+2+1	10	21	46	36	
Otitis Media / External - Chronic	2~3/week or 3+2+1	6	13	27	22	then once every 3~4 weeks
Otitis External - w/ Infection	2~3/week or 3+2+1	10	21	46	36	
Staph Infections - Local	2/week	6	13	27	22	
Sterile Pyogranulomatous Syndrome pyogranuloma / granuloma	Daily for 2~3x, then 2~3/week	6	13	27	22	

Therapy Protocol




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Pain, Tear, Edema, Lesions			Qualas4 (Infrared Laser 808nm)			
3+2+1 = Three treatments the first week, two the second, and one the third						
Indication	Indication	Dose (J/cm ²)	Therapy Time (sec.)			Notes Laser Power: 0.5 ~ 12W List: 3W Ø30mm Ball < 3W Ø50mm Ball < 6W Ø30mm Len < 12W
			Ball (Focus)		Len (Disp.)	
			<1.8cm ²	<3.8cm ²	>3.1cm ²	
						
			Ø30mm	Ø50mm	Ø30mm	
Anal Sacculitis / Acute	2~3/week or 3+2+1	8	6	12	9	
Anal Sacculitis / Chronic	2~3/week or 3+2+1	6	4	9	7	
Anterior Cruciate Ligament Tear - Chronic	2/week	6	4	9	7	
Anterior Cruciate Ligament Tear, Full - Acute	3+2+1	8	6	12	9	
Anterior Cruciate Ligament Tear, Partial - Acute	3/week	8	6	12	9	1~3/week for 3 weeks. Exercise restriction
Cauda Equina Syndrome	3+2+1	10	7	15	12	1 treatment every 2~4 weeks
Cystitis/Interstitial	3+2+1	8	6	12	9	
Cystitis/Urethritis/Feline Lower Urinary Tract Disease	3+2+1	8	6	12	9	1 treatment every 2~4 weeks
Edema	1~2x	10	7	15	12	
Hot Spots	3+2+1	10	7	15	12	
Inflammatory Bowel Disease	2~3/week or 3+2+1	10	7	15	12	
Intra-abdominal	1x during Surgery	10	7	15	12	
Lesions	2~3/week or 3+2+1	8	6	12	9	
Luxating Patella	3+2+1	10	7	15	12	
Musculoskeletal Pain	1~3x, once daily	10	7	15	12	
Myofascial Pain	2~3/week or 3+2+1	10	7	15	12	

Therapy Protocol

Arthritic, Joint, Hip, Disc			Qualas4 (Infrared Laser 808nm)			
Indication	Indication	Dose (J/cm ²)	Therapy Time (sec.)			Notes
			Ball (Focus)		Len (Disp.)	
			<1.8cm ²	<3.8cm ²	>3.1cm ²	
						
			Ø30mm	Ø50mm	Ø30mm	
Arthritic Conditions	2~3/week or 3+2+1	8	6	10	23	1 treatment every 2~4 weeks
Degenerative Joint Disease	2~3/week or 3+2+1	10	7	15	12	1 treatment every 2~4 weeks
Joint Injury - Acute	1/day for 6 days	16	11	24	19	
Hip Dysplasia	2~3/week or 3+2+1	10	7	15	12	
Degenerative Disc Disease	1/day for 3~5 days	10	7	15	12	then 2~3/week
Intervertebral Disc Disease	2~3/week or 3+2+1	16	11	24	19	

Therapy Protocol

Nerve Regeneration, Neuropathies, Tendon, Ligament			Qualas4 (Infrared Laser 808nm)			
Indication	Indication	Dose (J/cm ²)	Therapy Time (sec.)			Notes
			Ball (Focus)		Len (Disp.)	
			<1.8cm ²	<3.8cm ²	>3.1cm ²	
						
			Ø30mm	Ø50mm	Ø30mm	
Nerve Regeneration, Neuropathies	2~3/week or 3+2+1	10	7	15	12	
Perianal Fistulas	1/day for 3~5 days	6	4	9	7	then 2~3/week
Tendon & Ligament Injury	2~3/week or 3+2+1	10	7	15	12	
Tightrope/Extracapsular	3+2+1	10	7	15	12	
Traumatic & Overuse Injuries	2~3/week or 3+2+1	10	7	15	12	

Laser Power: 0.5 ~ 12W

List: 3W




Ø30mm Ball < 3W

Ø50mm Ball < 6W









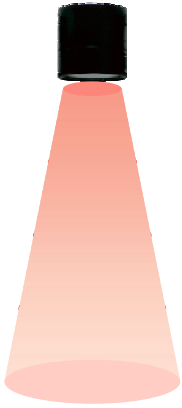
Ø30mm Len < 12W

Therapy Protocol

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Acupuncture, Trigger Point			Qualas4 (Red Laser 635nm) or (Infrared Laser 808nm)			
Indication	Indication	Dose (J/cm ²)	Therapy Time (sec.)			Notes
			Fiber Rod			Laser Power: 0.5 ~ 12W List: 1W
			 Ø8mm	 Ø8mm	 Ø4mm	
Acupuncture	3/week	3	4	4	2	Repeat every 2 days until disappearance of reactivity
Trigger Point	3/week	3	4	4	2	Repeat every 2 days until disappearance of reactivity

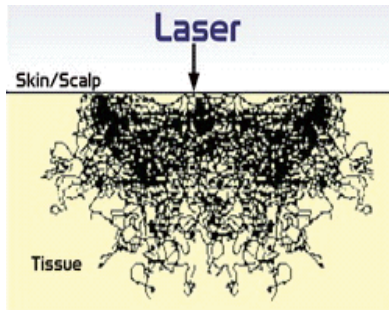
Therapy Protocol: Laser Heads Selection

Cap/Fiber	Ball		Len	Fiber Rod		
Radius	Ø30mm	Ø50mm	Ø30mm	Ø8mm	Ø8mm	Ø4mm
Contact Area	1.8cm ²	3.8cm ²	3.1cm ²	0.5cm ²	0.5cm ²	0.13cm ²
Picture						
Suggested Power	≤ 6W	≤ 12W	≤ 12W	≤ 1W		
Laser Beam Spot Size						

Treatment Time Calculation - 3D Model

- 1) Treatment time for tissue in depth is calculated by Monte Carlo Simulation method.
- 2) Energy loss percentage is between 5% ~ 10% per mm for different tissues.
- 3) Energy loss percentage is postulated to be linear at 7.5% per mm of tissue.
- 4) Energy Loss Factor = $1 \times (1 - 0.075)^n$ n = Depth of Tissue in mm

$$\text{Treatment Time (second)} = \frac{\text{Dose} \times (\text{J/cm}^3) \times \text{Laser Beam Spot Size (cm}^2\text{)}}{\text{End Power (W)} \times \text{Energy Loss Factor}}$$







Energy Loss Factor Calculation Table			
Depth of Tissue (cm)	Energy Loss Factor	Treatment Time (Tc) Factor	Simplified Factor
0 cm	1.0000	1	1
1 cm	0.4586	2	2
2 cm	0.2103	5	5
3 cm	0.0964	10	10
4 cm	0.0442	23	25
5 cm	0.0203	49	50
6 cm	0.0093	108	100

Treatment Time for Tissue in Different Depths

Indication	Wavelength- Power	Tissue Depth	Treatment Time	Therapy Protocol
Pain, Tear, Edema, Lesions Arthritic, Joint, Hip, Disc Nerve Regeneration Neuropathies Tendon, Ligament	808nm-12W	0 cm	1 sec. x Area(cm ²)	1) Est. Treatment Area 2) Cal. Treatment Time : 12 sec. x Area 3) Contact & Move; Speed: 2cm/sec.
		1 cm	3 sec. x Area(cm ²)	
	Optic Cap	2 cm	5 sec. x Area(cm ²)	
	Ball	3 cm	15 sec. x Area(cm ²)	
	4cm ²	4 cm	30 sec. x Area(cm ²)	
		5 cm	1 min. x Area(cm ²)	
		6 cm	2 min. x Area(cm ²)	

Simplified Therapy Protocol

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Simplified Therapy Protocol					
Indication	Wavelength- Power	Optic Cap & Fiber Rod	Treatment Time		Therapy Protocol
After Surgery Burns, Ulcers, Bite, Wound Gingivitis Periodontal Diseases Stomatitis	635nm-1W	Len 5cm ² 	12 sec. x Area(cm ²)		1) Est. Treatment Area 2) Cal. Treatment Time : 12 sec. x Area 3) Non-contact Move & Scan; 2cm/sec.
Pododermatitis Otitis, Infections	635nm-1W	Fiber Rod 	5 sec.		1) Point Treatment 2) Contact or Non-contact
Acupuncture Trigger Point	635nm-0.5W or 808nm-0.5W	Fiber Rod 	5 sec.		1) Point Treatment 2) Contact
Pain, Tear, Edema, Lesions Arthritic, Joint, Hip, Disc Nerve Regeneration Neuropathies Tendon, Ligament	808nm-12W	Ball 4cm ² 	Tissue Depth	Treatment Time	1) Est. Treatment Area 2) Cal. Treatment Time by Tissue Depth 3) Contact & Move; Speed: 2cm/sec.
			0 cm	1 sec. x Area(cm ²)	
			1 cm	3 sec. x Area(cm ²)	
			2 cm	5 sec. x Area(cm ²)	
			3 cm	15 sec. x Area(cm ²)	
			4 cm	30 sec. x Area(cm ²)	
			5 cm	1 min. x Area(cm ²)	
6 cm	2 min. x Area(cm ²)				

Tips and Troubleshooting

Read on for advice about using and troubleshooting Qualas4.

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My Qualas4 won't turn on

- ☑ Make sure Qualas4's power switch is on.
- ☑ Make sure Qualas4's **emergency switch** is released.
- ☑ If that doesn't work, check the connection from Qualas4 to the power cord and connect to a working electrical outlet.
- ☑ Refer your User's Guide for detailed operation steps.
- ☑ If that doesn't work, contact your local sales office.

Read on to learn about using Qualas4 safely and cleaning Qualas4.

Important safety instructions

When setting up and using your Qualas4, remember the following:

- ☑ Read user's guide carefully before you plug your Qualas4 Power Cord into a power outlet.
- ☑ Keep user's guide handy for reference by you and others.
- ☑ Follow all instructions and warnings dealing with your Qualas4.
Warning: Electrical equipment may be hazardous if misused.
- ☑ Operation of this device, must always be supervised by an adult. Do not allow children access to the interior of any electrical product and do not permit them to handle any cables.

Warning: Laser beam

- ☑ Avoid direct eye exposure to the laser beam.
- ☑ Because some Qualas4 lasers emit invisible infrared light, the usage of laser p[robes in the area of the face and around the eyes must proceed with appropriate care and caution. Invisible infrared laser light penetrating the eye may cause serious harm after extended exposure. Therefore, the use of the laser safety goggles for the patient and clinician is advised.

Avoid wet locations

Warning



- ☑ To reduce the chance of shock or injury, do not use your Qualas4 in or near water or wet locations.
- ☑ Keep your Qualas4 and power cord away from sources of liquids, such as drinks, wash basins, bathtubs, shower stalls, and so on.
- ☑ Protect your Qualas4 and the power adapter from direct sunlight and rain or other moisture.
- ☑ Take care not to spill any food or liquid on Qualas4 or its power cord. If you do, unplug Qualas4 before cleaning up the spill.
- ☑ Depending on what you spilled and how much of it got into your equipment, you may have to send your equipment to Konftec for service.



Do not make repairs yourself

Warning



- ☑ Do not attempt to open your Qualas4, disassemble it. You run the risk of electric shock and voiding the limited warranty.
- ☑ No user-serviceable parts are inside.

Cleaning

- ☑ Follow these general rules when cleaning the outside of your Qualas4 and its components:
 - ☑ Make sure your Qualas4 is unplugged.
 - ☑ Use a damp, soft, lint-free cloth. Avoid getting moisture in openings.
 - ☑ Don't use aerosol sprays, solvents or abrasives.



Konftec Corporation

12F-7, No.77, Sintai 5th Rd., Sec. 1,
Sijhih District, New Taipei City 221
Taiwan

www.konftec.com

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